November 18th

Unit 4: Inequalities
Lesson 4.1: Solving & Modeling Inequalities

Get Ready: Solve these equations

1. $5x + 1 = 3$

$$\frac{5x}{5} = \frac{2}{5}$$
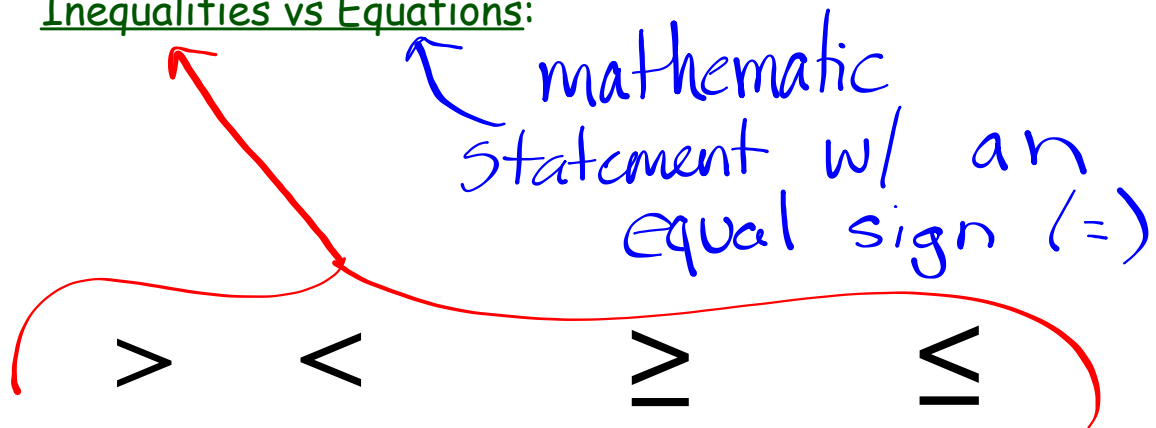
$$x = 2/5$$

2. $3w - 1 = -2 - 2w$

$$3w = -1 - 2w$$

$$\frac{5w}{5} = -1 + 2w$$

$$w = -1/5$$

3. $\dfrac{-5t}{4} = 2 \cdot 4$

$$\frac{-5t}{-5} = \frac{8}{-5}$$

$$t = -8/5$$

Inequalities vs Equations:

mathematic statement w/ an equal sign (=)

$>$ $<$ $\geq$ $\leq$

$g < 8$

g is less than 8.

$w \geq 8$

w is greater than or equal to 8.

Will inequalities give us an exact answer?

No, we will not have one # to represent the answer. Instead, a RANGE of #'s represents the answer to an inequality.

What is the difference?

$x > 8$ $8 > x$

BIG $>$ small

x is greater than 8.

8 is greater than x.

$6 > t$ $t < 6$

6 greater than t.

t less than 6.

Sam cuts a 10 m rope into two.

How long is the longer piece?

How long is the shorter piece?

Longer Piece:

7.8, ~~8~~, 6.9, 6.3, 7.8, 5.1,

6.9, 9.9, ~~10~~

Not one value/length the

longe piece could be.

Write an inequality to

show the RANGE of

Values.

Shorter Piece:

4.3, 0.5, 1, 4.9, 2, ~~0~~, ~~5~~

<u>Solving Inequalities</u>:

1. $5x + 1 < 3$

$$\frac{-1 \qquad -1}{}$$

$$\frac{5x}{5} < \frac{2}{5}$$

$$\boxed{x < 2/5}$$

2. $3w - 1 \geq -2 - 2w$

$$+2w \qquad\qquad +2w$$

$$5w - 1 \geq -2$$

$$\frac{+1 \qquad +1}{}$$

$$\frac{5w}{5} \geq \frac{-1}{5}$$

$$\boxed{w \geq -1/5}$$

3. $4\left(\dfrac{-5t}{4}\right) > (2)\,4$

$$\frac{-5t}{-5} > \frac{8}{-5}$$

$$t < {}^{-}8/5$$

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Rule when solving inequalities...

When you multiply or divide by a **negative #**, flip the direction of the inequality symbol.

Beth is a waitress. She need to make **at least** 250 dollars on Friday and Saturday night in order to pay her bills next week. She made $112 on Friday night. How much does she need to make Saturday?

Write an INEQUALITY that represents this situation.

$$x = \text{\$ made on Saturday}$$

$$112 + x \geq 250$$

Solve your Inequality.

$$250 \leq 112 + x$$

$$138 \leq x \quad \text{or} \quad x \geq 138$$

Jimmy is saving up money for the new xbox. He needs $400 for the new system and a new game. He already has $130 saved up and is shoveling driveways for extra money. If he charges $15 a driveway how many does he need to shovel to have enough money?

Write an INEQUALITY that represents this situation.

$$400 \leq 15x + 130$$

Solve your Inequality.

$$15x + 130 \geq 400$$
$$\quad\quad -130 \quad\quad -130$$
$$\frac{15x}{15} \geq \frac{270}{15}$$
$$x \geq 18$$

Mrs. Mills is baking some treats for the holidays for the party in her neighborhood. She has already spent $38 on cookies but would also like to make some pies. She **doesn't want to spend more than** $100 on all of the treats.

How many pies can she make if each pie costs her $8?

Write an INEQUALITY that represents this situation.

$$100 \geq 38 + 8P$$

Solve your Inequality.

$$38 + 8P \leq 100$$
$$-38 \qquad\qquad -38$$
$$\frac{8P}{8} \leq \frac{62}{8}$$
$$P \leq 7.75$$
$$\boxed{P \leq 7}$$